

Geologic Time Review

1. Relative Dating – putting events in order by comparison.

List the features from oldest to youngest and then state which laws you used. Define the laws at least once each as well.



A. Label the oldest as #1, youngest as #3.

B. List and define laws used:

includeded frag - are older than the rock they are in
cross-cutting relations - a dike is younger than the rock it cuts across

C.

Youngest

K

J

I

H

P

M

L

N

O

Q

Oldest

D. List and define laws used:

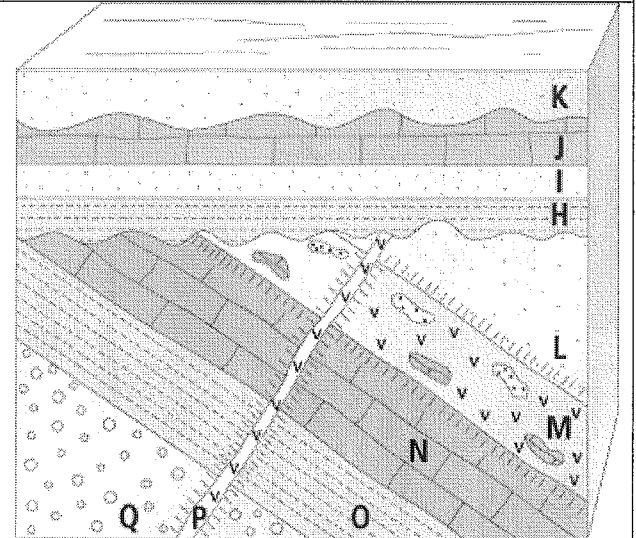
superposition

unconformity

- cuts across

- has incl frag.

superposition



2. Radiometric Dating – a method of finding a specific numerical age.

a. What restrictions are there when using Carbon 14/Nitrogen 14 dating?

half life = 5730 yrs, only use up to 60,000 yrs, only previously living

b. Define half-life.

the length of time for half the parent to decay and become stable daughter

c. Describe how to find the age of a rock using the Uranium 238/Lead 206 isotope.

Compare how much parent (U) and daughter (Pb) there is to find # of half-lives. Then Age = $\frac{\# \text{ of half-lives}}{h.l.} \times \text{length of h.l.}$

- d. A rock is found that has 16 parents and 112 daughters in it. If the half-life is 3 million years, how long ago did the magma solidify?

$$16 + 112 = 128 \text{ P} \rightarrow \begin{matrix} 64 \text{ P} \\ 64 \text{ d} \end{matrix} \rightarrow \begin{matrix} 32 \text{ P} \\ 96 \text{ d} \end{matrix} \rightarrow \begin{matrix} 16 \text{ P} \\ 112 \text{ d} \end{matrix} \therefore 3 \text{ h.l.}$$

$$\text{Age} = 3 \text{ h.l.} \times 3 \text{ mill yrs} = 9 \text{ mill years old}$$

3. Fossils – preserved evidence of past life.

- a. What types of rocks are fossils formed in? *sedimentary (shale usually)*
- b. Describe the 6 different types of fossilization methods.

carbonization -
 replacement -
 amber -
 mold and cast -
 unchanged remains -
 trace fossils -

See notes for descriptions

- c. Why would a fossil found in only one location on the Earth not be an index fossil?

must be wide spread geographically





Why would a clam shell not be an index fossil?


too common, not unique looking

Why would a fossil found both in the Cambrian and in the Tertiary not be an index fossil?

existed for too long a time on Earth


- d. Sketch the 6 types of phyla that we discussed. State one distinguishing feature of each.

Mollusca
 pelecypod  symmetrical edge-on
 gastropod 
 ammonoid  extinct
Brachiopod
 flatter one side - almost extinct

Arthropod
 trilobite - extinct 
 spider
 ladybug

Vertebrate
 have spines
 humans
 birds
 reptiles

Plants
 live on land

Echinoderm
 5 fold symmetry


4. Geologic Timescale – Major events in Earth's history are organized.

- a. How did geologists decide where the division lines for the eras and periods go?

- by main life that lived then
 - by major events that occurred

b. What are the recent 3 eras the "ages of...." ?

Cenozoic – age of the mammals

Mesozoic – age of the reptiles

Paleozoic – age of the invertebrates

c. Why are there very few fossils found in the Precambrian era?

- not as much life
- life didn't have hard parts so not easily fossilized

d. Put the following events in order:

- 2nd First vertebrates (fish) 485 my
- 4th First reptiles 320 my
- 3rd First amphibians 410 my
- last Primitive humans 2 my
- 6th First birds 192 my
- 9th North America joined to South America 5 my
- 5th First mammals 230 my
- 7th/8th Dinosaurs die out 135 my
- 1st Algae first forms Precamb.
- 7th/8th Uplift of Rockies begins 135 my

re-write in order

e. How old is the Earth?

4.5 billion years old

f. Briefly describe the Earth's history starting from the beginning of the universe, the big bang 13.7 billion years ago....

- big bang - 13.7 by. ago, everything in the spot that rapidly expanded
- clumps formed and pulled together due to gravity
- our Milky Way Galaxy was one clump.
- in galaxy a nebula started pulling together, 99.99% formed sun, rest the planets in orbit around sun
- 3rd planet out is \oplus , was all molten, then cooled, atmosphere and life formed